CRT-RMS CROSS-CULTURAL STUDY WITH KOREAN COLLEGE STUDENTS

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CRT-RMS CROSS-CULTURAL STUDY WITH KOREAN COLLEGE STUDENTS

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SUMMARY

The Conditional Reasoning Test-Relative Motive Strength (CRT-RMS; James, 1998) has shown to be a psychometrically reliable and valid approach for measuring implicit motives and biases in United States and European contexts (James & Rentsch, 2004; Mot, 2003). Extended from previous research, the current study demonstrated the utility of the CRT-RMS with a sample of 186 college students in Korea. The results showed a significant association between the CRT-RMS scores and Korean college students' grade point average. Korean samples also supported the dissociative model in relating with self-report measures. Additionally, mean score differences on implicit and explicit measures of achievement motivation between Korean and US samples provided meaningful information. Implications of cross-culturally valid implicit measures are discussed.

CHAPTER I

INTRODUCTION

The Conditional Reasoning Test-Relative Motive Strength (CRT-RMS) introduced by James (1998) is a relatively new methodology to measure individuals' cognitive biases with respect to their motives to either achieve or avoid failure. With its psychometrically sound properties and its uniqueness in terms of measuring implicit personality, the CRT has been praised by numerous researchers as "psychometrically sound" (Hollenback, cited in Morgeson, Campion, Dipboye, Hollenbeck, Murphy, & Schmitt, 2007 p.718), and as "a model for psychometric, conceptual, and theory-based implicit association measurement" (Landy, 2008 p. 390). On the other hand, since relatively little attention has been directed towards samples from different cultural backgrounds, the CRT-RMS's validity without a restricted sample has been questioned (Ones, Dilchert, Viswesvaran, & Judge, 2007). Thus, a cross-cultural study of the CRT-RMS was in order to explore its external validity. The CRT-RMS is derived from theory-based justification processes, and basic personality theories have shown similar outcomes across cultures (Chang & Lee, 1994). Therefore, it is expected that the CRT-RMS will be useful cross-culturally to understand implicit motives to achieve and avoid failure.

In addition, for countries where the concept of implicit personality is not well developed nor adopted, studying implicit personality measures will provide meaningful

information since the implicit measure predicts differently from what traditionally used self-report personality measures predict. US college student samples have shown that implicit and explicit measures tend to have a lack of significant association with each other and to predict different behaviors (Frost, Ko & James, 2006; McClleland, Koestner, & Weinberger, 1989; Schultheiss & Brunstein, 2001). This differential association is referred to as the "dissociation model." That is, an implicit measure assessing a specific construct (e.g. relative motive strength) is not expected to be associated with scores on a self-report measure assessing a theoretically similar construct (e.g. a self-report achievement motivation test). Moreover, the implicit measure is expected to be associated with a hypothesized objective outcome, whereas the self-report counterpart is not expected to demonstrate a significant association with that objective criterion.

Furthermore, implicit personality theory provides significantly meaningful information beyond what explicit personality measurements can explain about individual behaviors. For example, implicit and explicit measures of self-esteem demonstrate different results in different cultures. According to the literature, East Asians show significantly low explicit self-esteem as compared to Westerners (Schmitt & Allik, 2005), whereas their implicitly measured self-esteem was at about the same level as that of Americans (Kobayashi & Greenwald, 2003). Therefore, it is worthwhile to explore the utility of the CRT-RMS with

samples from other countries and to investigate its discriminant validity through the dissociation of implicit and explicit measures.

Attempting to compare students' motives using self-report measures across cultures leads to significant methodological problems when researchers use aggregated data (Heine, Buchtel, & Norenzaya, 2008). For example, when people respond to the Revised NEO Personality Inventory (NEO-PI-R; Costa & McCrae, 1992), they tend to compare themselves to others within their own cultures, not to any global standard (if there is one). When Koreans respond to the statement, "I'm something of a 'workaholic,'" they tend to implicitly compare themselves to other Koreans rather than to people across the Pacific Ocean. This is called the "reference-group effect" (RGE: Heine, Lehman, Peng, & Greenholtz, 2002; Peng, Nisbett, & Wong, 1997), which is described as "the tendency for people to respond to subjective self-report items by comparing themselves with implicit standards from their culture" (Heine et al., 2002; Hein, Buchtel, & Norenzaya, 2008). The RGE shows that people with different cultural backgrounds tend to have different implicit standards. This leads to a problem with aggregated data when it comes time to compare them with people from other countries.

The purpose of this study is to validate the CRT-RMS with Koreans by demonstrating its association with Korean college students' GPA, its discriminant validity with self-report measures and dissociative models, and its aggregated mean score differences between Koreans and Americans compared to group level mean self-report measures.

CHPATER II

REVIEW OF THE LITERATURE

CRT-RMS Validation with Korean College Students

Everyday people do things based on what they believe is right or think is appropriate. This judgment, belief, or idea is not the same for everybody; even in the same situation people can make different judgments, and they act accordingly. Even if they pursue the same demanding tasks, when they are asked why they want to accomplish these tasks they may give different reasons. For example, individuals highly motivated to achieve and those highly motivated to avoid failure pursue the same demanding tasks for different reasons. They have different justifications even though both groups accomplish the same work. Individuals with high achievement motivation and individuals with a high fear of failure are not on opposite ends of single continuum. People who do tasks to avoid failure simply do not have the same reasoning processes as people who just do not want to complete the work (i.e., people with no motivation to either achieve or avoid failure).

According to James (1998), the reasoning biases that achievement-motivated individuals use to make their actions appear rational and sensible are called "Justification Mechanisms for Achievement Motivation (JMs)." These biases, or JMs, do not sound logical or reasonable to individuals with a fear of failure since they have their own JMs for accomplishing the demanding tasks. However, to individuals with high achievement

motivation, these JMs appear sensible and rational. More interestingly, these biases are implicit, and as a result achievement-motivated individuals unconsciously rationalize their actions and beliefs using these JMs.

High-achievement-motivated individuals have different cognitive biases about the achievement of goals than people who are less or not achievement-motivated. For instance, if individuals with implicitly high achievement motivation fail at a task, they are more likely to persistently try the task again rather than give up easily. They also believe they are responsible for their performance (James, 1998; McClelland & Boyatzis, 1982; Weiner, 1991), frame demanding tasks as a learning process, and believe they can develop skills through practice or training (James, 1998). They see their effort as "involvement" and "commitment" (James, 1998). A list of JMs for achievement motivation is presented in Table 1.

Table 1 Justification Mechanisms for Achievement Motivation

1. Personal responsibility inclination: tendency to favor personal factors such as initiative, intensity, and persistence as the most important causes of performance on demanding tasks.
2. Opportunity inclination: tendency to frame demanding tasks on which success is uncertain as "challenges" that offer "opportunities" to demonstrate present skills, to learn new skills, and to make a contribution.
3. Positive connotation of achievement striving: tendency to associate effort (intensity, persistence) on demanding tasks to "dedication," "concentration," "commitment," and "involvement."
4. Malleability of skills: tendency to assume that the skills necessary to master demanding tasks can, if necessary, be learned or developed via training, practice, and experience.

5. Efficacy of persistence: tendency to assume that continued effort and commitment will overcome obstacles or any initial failures that might occur on a demanding task.
6. Identification with achievers: tendency to empathize with the sense of enthusiasm, intensity, and striving that characterize those who succeed in demanding situations. Selectively focus on positive incentives that accrue from succeeding.

Sources: James, L. R. (1998). Measurement of Personality via Conditional Reasoning. *Organizational Research Methods*, 1, 131-163

Individuals with a fear of failure have different implicit biases than achievement-motivated individuals. They demonstrate a different motive. While achievement-motivated people have strong motives to achieve, fear-of-failure individuals have strong motives to avoid failure. People with a high fear of failure tend to blame external factors for their failures (Hinshaw, 1992; James, 1998; Taylor, 1991); are likely to perceive demanding tasks as threats, stressful, or overloading work (Bäckman & Dixon, 1992; James, 1998); and do not think they can enhance or develop their deficient skills (James, 1998; Taylor & Brown, 1988; Weiner, 1991). For instance, when a test grade is not good, achievement-motivated people believe they are responsible and are likely to frame this as a learning process. They believe they can improve their skills to get a higher grade and will persistently put more effort into their study. People with a fear of failure, however, tend to believe they cannot learn or improve their skills to get a better grade. Fear-of-failure individuals are likely to view demanding tasks more negatively and are less likely to see the value of demanding tasks. They just do the work or study because they have to and do not enjoy it.

Since there is consistency in personality traits across countries (Church & Loner, 1998; Paunonen & Ashton, 1998) and especially since implicit motives or personalities are shaped at a very early age (McClelland et al., 1989), they should be less culturally affected. Therefore, different justification processes should be universal, not confined to Americans. People who are committed to work, enjoy the work, see failure as a learning process, and persistently try to improve their skills will be identified as high-achievement-motivated individuals in most countries. People who tend to get stressed by demanding tasks and who do not believe they can improve their skills will not be identified this way.

Among Asian countries where the CRT-RMS has not been validated, Korea was selected since Korean students tend to show higher achievement in international student assessments such as the Program for International Student Assessment (PISA; OECD, 2004) and the Trends in International Mathematics and Science Study (TIMSS; Leung, 2002). Although objective test scores show that Asians tend to outperform their counterparts, an implicit personality approach across countries to explain this phenomenon is lacking. This may be because there is no concrete achievement motivation measure available to compare countries since comparing mean scores based on self-report measures between countries does not provide any insightful information. More interestingly, in 2003 PISA showed that even though Korean 15-year-old students' scores were higher than most other countries', they also rank in the top five countries in terms of test anxiety (Lee, 2008). In Korea, there tends to be

mixed results about the relationship between test anxiety and academic performance. Therefore, the study of Korean students' implicit motives to achieve and avoid failure is unavoidable and may provide an explanation to fill the gap between the mixed results.

Cross-Cultural Studies and a Dissociative Model

Although Morgan and Murray (1935) initiated the idea of implicit motives in the 1930s, this area remained quiet for several decades. Starting with McClelland in 1987, however, implicit motives were raised again, and several implicit measures have been developed (i.e., Picture Story Exercise; PSE; Koestner & McClelland, 1992; CRT-RMS, James, 1998). By using these measures, implicit motives have been studied with US and German samples; they have shown that, unlike traditional self-attributed motives that tap into our conscious level of motives, implicit motives assess the unconscious level of these motives (King, 1995; McClellaland, Koestner, & Weinberger, 1989; Schultheiss & Brunstein, 2001). For example, an explicit aggression measure assesses the physical aggression of basketball players while an implicit aggression measure assesses passive aggression such as the obstructionism of basketball players (Frost, Ko, & James, 2007). There are several cross-cultural studies on implicit motives for power and affiliation (Hofer, Chasiotis, Friedlmeier, Busch, & Campos, 2005), implicit motives with life satisfaction (Hofer, Chasiotis, & Campos, 2006), and implicit self-esteem (Boucher, Peng, Shi, & Wang, 2009; Pelham, Koole, Hardin, Hetts, Seah, & DeHart, 2005, Yamaguchi et al, 2007). While the implicit personality provides

meaningful information about Western samples, cross-cultural studies on implicit motives to achieve have remained virtually untested. Only one study by Hofer and Chasiotis (2004) validated implicit motives to achieve using a Thematic Apperception Test (TAT) type Picture-Story Test cross-culturally between Germany and Zambia.

Hofer and Chasiotis (2004) validated the TAT with a Zambian population. They used five pictures of *ship captain, architect at a desk, couple by river, women in a lab, and trapeze artists* to assess implicit motives for power, achievement and affiliation. Zambian samples were shown each picture for 30 seconds and asked to write imaginary stories for five minutes. Two independent coders scored the stories following Winter's (1991) scoring system based on story content. However, their results were disappointing due to the low educational level of the Zambian samples. As a certain level of writing ability in English is required and is critical in a TAT (Ervin, 1964), the insufficient level of writing ability and low educational level in the Zambian sample produced method bias rather than showing cultural differences in implicit motives. Perhaps, then, a TAT may not be valid across cultures due to language restrictions. To be validated in non-English speaking countries, once imaginary stories are written in another language each respondent's story needs to be translated into English; but the more translation is needed the more likely it is there will be errors.

The CRT-RMS is easier to use to test cross-culturally since the CRT-RMS does not require a specific English writing level. If the measure is translated once it can be

administered to hundreds and thousands of participants without any further translation process. In addition, each CRT-RMS item is theory-based rather than empirical, so the CRT-RMS will be more resistant to cultural bias. If a measure is empirically keyed, cross-cultural researchers may need to change the scoring key according to each culture and it will be difficult to compare implicit motives between countries. Because of the aforementioned drawbacks of previous measures of implicit motives, there is no study that tests a dissociative model across cultures. This study will test a dissociative model with a more practical measure of implicit motives with different cultures: the CRT-RMS.

In terms of a dissociative model, three factors have been identified that lead to different outcomes from implicit and explicit motives. One of the factors that influences inconcordance is methodological function (Thrash & Elliot, 2002). This study will investigate motives to achieve using explicit and implicit measures. Criteria will be self-reported grade point averages (GPA) and objective GPAs retrieved from school records. Based on a dissociative model, implicit motives to achieve should predict the objective GPA while the self-report motive to achieve will predict the self-reported GPA.

Mean Score Differences on the CRT-RMS and Other Self-Report Measures

Popular self-report measures of achievement and fear-of-failure are the Work and Family Orientation questionnaire (WOFO; Helmreich & Spence, 1978) and the Test Anxiety Scale (TA; Sarason, 1978), respectively. Sample items from these measures are, “I prefer to

work in situations that require a high level of skill" (from WOFO), "I like to be busy all the time" (from WOFO), and "I seldom feel the need for 'cramming' before an exam" (from TA). When students respond to these items they implicitly compare themselves with their peers. If they think they tend to feel the need for cramming before an exam more often than people around them, they will be more likely to strongly agree. The issue here is that "people around them" are not the same group for Koreans and Americans or even for smaller groups, such as between schools. Koreans are not likely to compare themselves to Americans when they respond to these items, and vice versa. Therefore, comparing the mean scores of these measures will be less likely to provide sufficient information to provide explanations for any phenomenon. In another words, there will be no significant differences between self-report measures to explain why Korean students tend to score higher on the international standardized tests than American students do.

Lafontaine and Monseur (2007) found that countries' variations in the motivational constructs responses of PISA 2003 were not random; there was a regular pattern. For relative variables that require comparison with their peers, correlations between relative variables (i.e., intrinsic and extrinsic motivations, self-concept) and mathematics scores were significantly different between homogeneous and heterogenous groups. On the other hand, for non-relative variables (i.e., self-efficacy) there was no group difference between the two groups. For example, in Belgium, where students with the same ability level go to the same school, there

was a significant difference between the standardized and rough correlations, while in Norway, where students are randomly assigned to schools, there was no or only a small difference between the standardized and rough correlations. Lafontaine and Monseur (2007) concluded that this was due to the different reference groups students compare themselves with when they respond to relative items, and comparing only mean scores without considering the reference group will lead to serious misinterpretation.

The CRT-RMS will be less influenced by a reference group. The implicit measure of achievement motivation taps into the unconscious cognitive process; therefore, students are more likely to think what they believe rather than to compare themselves to others. To justify or make their decisions sensible, they do not need a reference group; they will not even feel it necessary to think about others. Therefore, the CRT-RMS will be resistant to RGE. In addition, scores on the CRT-RMS will provide meaningful explanations as to why Korean students tend to score higher on international tests (i.e., PISA or TIMSS). The expectation is that Korean college students' CRT-RMS scores will be significantly higher than American college students' CRT-RMS scores, while there will be no significant mean score differences on self-report measures.

The specific study hypotheses for the Korean sample are as follows: 1) A significant positive correlation is expected between the Korean CRT-RMS and objectively obtained GPA data; 2) Based on the dissociation model, the self-report achievement motivation tests

will be significantly correlated with each other but not with the Korean CRT-RMS and not with objectively obtained GPA data; 3) There will be significant differences in the CRT-RMS mean scores of Koreans and US college samples, but mean scores on self-report measures will not be significantly different.

CHPATER III

METHODOLOGY

Participants and Procedures for the Study

Korean Participants: 213 Korean college students enrolled in three different universities' psychology courses (approximately 80 students for each school) participated in the study. One school is located in Seoul, the capital city of Korea, while the other two schools are located in the suburbs. After excluding students without GPAs from school reports and with more than three illogical responses, 186 participants had usable data. The mean age is 22, with 25% males (74.5% are females and one person did not indicate). The high proportion of women is because one of the schools participating in this study is a women's university. Of the subjects, 69.5% are from a psychology department and 25.7% are from other departments, with one person not responding.

US Participants: 193 US college students' data on the CRT-RMS, WOFO, and TA were obtained from a previous study. For this cross-cultural study, individuals who indicated themselves as Asians and respondents with more than three illogical alternatives were excluded. This led 156 participants with a mean age of 19, 55.8% males, and 78.2% Cacausians.

Procedures for the Validation Study: During a class period, students were asked to complete the CRT-RMS, biographical information, and academic release information. Their

GPAs were obtained by self-report and also from objective records in the academic system. The Korean Scholastic Aptitude Test (KSAT) scores could not be obtained from school records; it is much more difficult to get KSAT scores from schools in Korea than to get similar scores in the United States since not every school in Korea keeps track of students' KSAT scores.

Measures

Translation Process: The first technique was back-translation, which is the most popular translation process and has been shown successful since the 1960's (Fink, 1963; Werner & Campbell, 1970; Sinaiko, 1963). To have a more accurate translation process, a bilingual technique was added (Prince & Mombour, 1967) that targets people who speak both English and Korean. This bilingual test-retest showed a reliability of .56 via MMPI-2 with Korean and English speakers (Chug, Weed, & Han, 2006). Butcher (1996) mentioned that this method is very important to check the accuracy and adequacy of a translated measure.

My native language is Korean and I am familiar with the measure, so I translated the original measure into Korean. Then, in order to test bilingual test-retest reliability, 16 Korean graduate students who attend schools in the United States were asked to complete both the Korean and the English measures. To be a graduate student in the United States, these students had to take the Test of English Foreign Language (TOEFL) and obtain a score higher than 550 points out of 630. Thus, Korean graduate students are considered to be

competent in writing and reading English. Half of the participants were asked to complete the Korean CRT-RMS first, and a week later they were asked to complete the English CRT-RMS. The other half of the group was asked to do the same in the reverse order. Next, I compared their responses on both measures and resolved any discrepancies by changing words in the Korean CRT-RMS. Once this task was completed, I asked a third person who had never seen the English CRT-RMS measure and was blind to the purpose of the study to back-translate it into English. Finally, I asked a native English-speaking psychology student who is familiar with the CRT-RMS to check if the meanings in the original version of the CRT-RMS and the back-translated version were equivalent. The Korean and back-translated versions of the CRT-RMS are attached (see Appendices).

Achievement Motivation and Fear of Failure. Achievement motivation was measured using the Korean CRT-RMS. This test consists of sixteen reasoning items with one bogus item. For each item, premises and reasoning tasks are followed by five possible solutions (alternatives). People who endorse achievement motivation alternative are scored +1, fear of failure alternative are scored -1, and the rest of the responses are scored 0. High scores indicate a high motivation to achieve, while low scores indicate a high motivation to avoid failure. Respondents who supplied more than three illogical responses were dropped from further analysis. This is because the illogical responses are so clearly wrong that no one who is taking the test should select one of them.

A sample item is presented in Table 2. In this question, alternative D is an obviously illogical response. Alternative C is the achievement motivated individuals' response based on their JMs. They have cognitive opportunity biases and positive connotations of achievement striving and efficacy of persistence. They believe hard working may lead to burnout; however, professionals who frame demanding tasks as a chance to learn new skills are less likely to burnout. Additionally, they implicitly believe that effort is necessary to overcome obstacles, and effort means dedication, involvement, and commitment to succeed at a demanding task. Therefore, they are less likely to see professionals become burnt-out. Alternatives A and B are fear of failures' responses. They tend to frame efforts for a demanding task as overloading and stressful instead of requiring commitment or involvement. Therefore, they reason that stressful jobs lead to burnout, since they are less likely to see the value of demanding tasks.

Table 2 An Illustrative Conditional Reasoning Problem

Burnout is a problem experienced by many professionals who work in intense jobs that require dedication and many hours of work. It consists of feelings of being stressed, tired unable to perform at peak levels, and lack of ability to control events. It seems that people who dedicated themselves to difficult, intense jobs are opening themselves up to burnout. Which one of the following would most weaken this conclusion? a. People in non-stressful jobs have little trouble with burnout. b. People who are the most likely to suffer burnout are highly obsessive and compulsive about their work. c. Not all professionals develop burnout. d. Professionals tend to make more money than non-professionals. Sources: James, L. R. (1998). Measurement of Personaity via Conditional Reasoning. *Organizational Research Methods,* 1, 131-163

Self-report measures. To measure self-reported motive to achieve, I used Helmreich and Spence's (1978) Work and Family Orientation Questionnaire (WOFO), and the NEO Achievement Motivation (NEO-AM) facet of the Conscientiousness factor (Costa & McCrae, 1992). I used Sarason's (1978) Test Anxiety Scale (TA) as an indicator of self-reported motive of fear of failure. These measures were translated into Korean using the back-translation technique.

CHAPTER IV

RESULTS

Item level analysis shows that five items from the CRT-RMS are likely not appropriate to Korean samples. One item required knowledge about the US school system, on two items more than half of the respondents endorsed illogical responses, on one item 97% of participants endorsed the Achievement Motivation (AM) response, and on one item 97% of participants selected the Fear of Failure (FF) response. These two items were not meant to be extreme AM or FF alternatives. Therefore, these five items were excluded from further analysis.

The internal consistency of the CRT-RMS Korean version was measured using the Kuder-Richardson (Formula 20). The reliability was 0.57. This coefficient, which is lower than that of the English CRT-RMS (KR = .85), could be due to the reduced number of items in the measure (10 reduced from 15). Based on the Kuder-Richardson formula if the number of items is doubled then the reliability would be .80 and with 30 items the reliability reaches to .87. The CRT-RMS Korean scores ranged between -6 and 10 out of a possible range of -10 and +10 (see Table 3). A negatively skewed distribution was expected as the samples were drawn from selective colleges. The mean score of the Korean CRT-RMS was 3.73 with a standard deviation of 2.84; there was a significant mean score difference between one school and the other two schools. The students from the most competitive and selective program

received significantly higher scores than the students from the other two schools (F (2,185) = 8.65, $p < .001$). This was also anticipated as students in more selective colleges tend to have a higher achievement motivation than students in less selective colleges. Self-reported GPAs were obtained from only 152 participants because some of the participants were freshmen and therefore their GPAs were not known at the time of data collection. There was no significant Korean CRT-RMS score difference between participants who reported their GPAs and students who did not.

Table 3 Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Age	185	19	51	22.24	2.99
Self-Report GPA	152	2.00	4.37	3.59	.43
GPA from School Record	186	1.72	4.42	3.47	.51
CRT-RMS Korean	188	-6.00	10.00	3.73	2.84
Work and Family Orientation Scale	186	45.00	107.00	65.92	7.97
Test Anxiety Scale	186	38.00	85.00	56.16	7.80
NEO-Achievement Motivation	186	13.00	39.00	25.25	5.01

Preliminary Study

Before validating the Korean CRT-RMS measurement, I compared the Korean and the original CRT-RMS measurements to make sure that the Korean CRT-RMS had comparable measurement properties with the original CRT-RMS (see Table 4). To test the invariance between measurements, exploratory and confirmatory factor analyses are ideal but

due to the small number of US subjects (N=153) and the small number of items, after dropping the five invalid items (leaving 10 items), the factor analyses seemed unlikely to produce meaningful results. Therefore, to compare between the Korean and the original measurements, I reviewed the proportion of AM responses, the correlation between AM response and the total CRT-RMS scores, and distribution of CRT-RMS scores.

Table 4 Proportions of AM responses and Polyserial Correlations

	CRT-RMS 4	**CRT-RMS 5**	**CRT-RMS 8**	**CRT-RMS 9**	**CRT-RMS 11**	**CRT-RMS 12**	**CRT-RMS 13**	**CRT-RMS 14**	**CRT-RMS 15**	**CRT-RMS 16**
Korean$_1$	59.6%	87.2%	55.3%	35.6%	48.9%	81.9%	37.2%	63.6%	93.6%	76.7%
Korean$_2$	0.361	0.459	0.632	0.536	0.424	0.405	0.381	0.576	0.424	0.341
US$_1$	59.0%	59.0%	54.5%	40.4%	55.1%	70.5%	38.5%	51.3%	89.7%	72.4%
US$_2$	0.299	0.587	0.566	0.233	0.368	0.478	0.285	0.469	0.555	0.488

Note. 1. Proportions of AM responses. 2. Polyserial correlation between the AM response and the total CRT-RMS scores.

On the Korean measurement, 35-94% participants endorsed AM response and 39-90% of the US students chose AM response for each item. Nine items seemed comparable between the two measurements based on the respondents′ proportions. On one item, 94% of the Korean participants chose the AM response; however this item was not dropped because 90% of US respondents also endorsed the AM response. As this item purposefully was written as extreme it seemed to be a highly attractive alternative in both cultures. On another

item, 87% of Korean respondents selected the AM alternative while 59% of US students endorsed the AM alternative and this could be due to cultural difference.

As a second step, the polyserial correlation between the AM response and the total CRT-RMS scores were compared between the Korean and English CRT-RMSs. Their correlations showed similar relationships between each item and the total scores in both Korean and English CRT-RMS; the polyserial correlation coefficient ranged from .34 to .63 and .23 to .59, respectively. Lastly, both the Korean and US students showed a negatively skewed distribution (see Figures 1 and 2). Similar to the Korean students, the US students were also recruited from a competitive college and therefore a negatively skewed distribution was expected. Further comparison in terms of mean scores is followed in the next section.

Figure 1 Korean College Samples' CRT-RMS Score Distribution

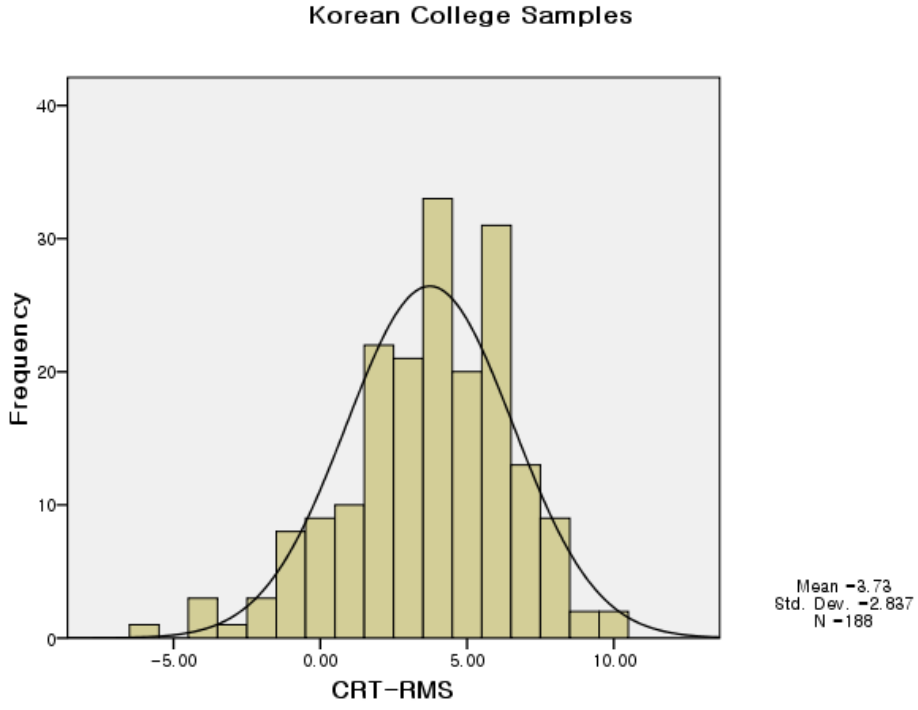
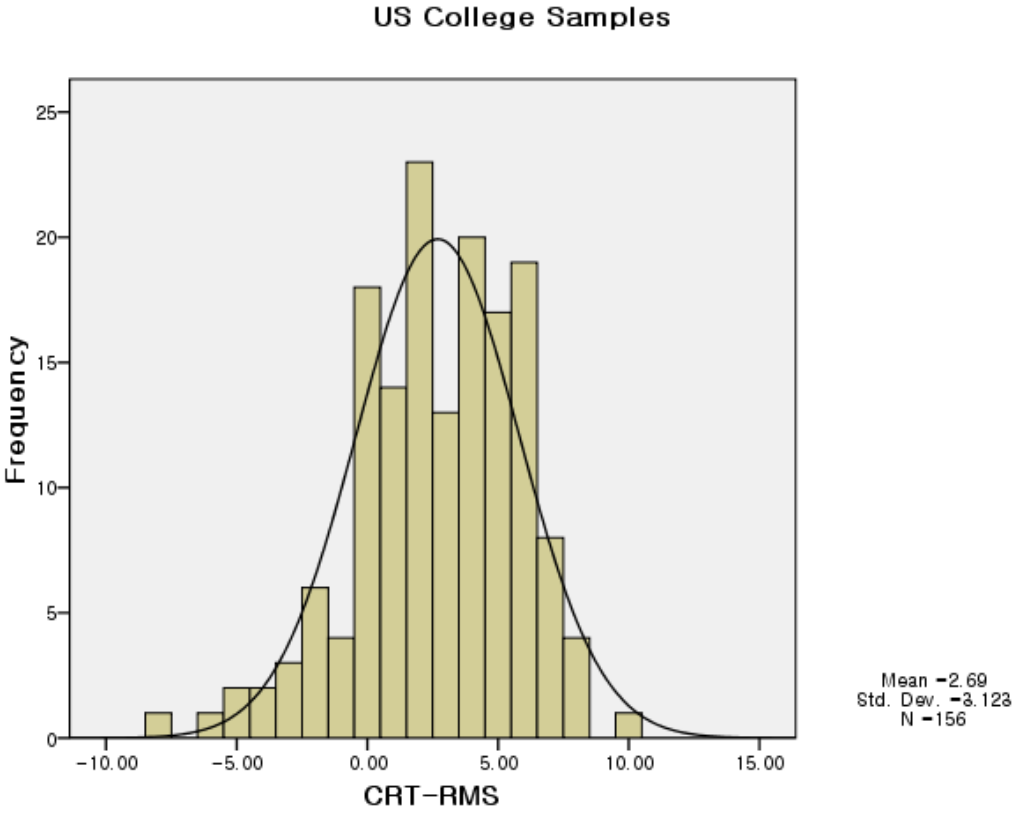


Figure 2 US College Samples' CRT-RMS Score Distribution



Validity Studies

Hypothesis 1 is supported in that the total score of the Korean CRT-RMS shows a significant positive correlation with Korean college students' GPAs (r = .177, p <.05) (see Table 5). Discriminant validity was investigated by looking at the associations between the Korean CRT-RMS and the self-report measures of WOFO, NEO-AM or TA. No significant correlations were found. This result supports previous studies showing that the CRT-RMS is not associated with the self-report counterparts. Although the two self-report measures of achievement motivation, WOFO and NEO-AM, are highly correlated with each other (r = .581, p < .001), these two measures are not correlated with the CRT-RMS.

Table 5 Correlation between CRT-RMS, GPA and self-report measures

	GPA from School Record	Self-Reported GPA	CRT-RMS Korean version	Work and Family Orientation	Test Anxiety	NEO-Achievement Motivation
GPA from School Record	1					
Self-Reported GPA	.867(**)	1				
CRT-RMS Korean	.177(*)	.101	(.57)			
Work and Family Orientation	.081	.130	-.069	(.63)		
Test Anxiety Scale	-.120	.039	-.132	-.037	(.75)	
NEO-Achievement Motivation	.098	.227(**)	-.031	.581(**)	.006	(.83)

Note. *$p < .05$, **$p < .01$. Numbers in parentheses are reliabilities.

Hypothesis 2 is also supported, as the self-reported achievement motivation tests are significantly correlated with each other but they are not associated with the Korean CRT-RMS and also not with objectively obtained GPAs. First, the Korean CRT-RMS score based on ten items is significantly associated with the GPAs from school records but not with self-reported GPAs. Interestingly enough, none of the self-report measures have a significant relationship with objectively obtained GPAs. However, the NEO-AM is significant in predicting self-reported GPAs ($r = .227$ $p < .001$). A t-test for dependent correlations was used to determine whether the two dependent correlations are significantly different (Steiger,

1980). In terms of predicting objective college GPAs, the CRT-RMS and WOFO were not significantly different (t (185) = .90, p < .05) and also the CRT-RMS and NEO-AM were not significantly different (t (185) = .76, p < .05), however, the CRT-RMS and TA had significantly different predictions (t (185) = 2.72, p < .05).

Hypothesis 3 is partially supported in that Korean college students score higher on the CRT-RMS than US college students, but Koreans score lower on self-reported achievement measures (see Table 6). Mean scores of the CRT-RMS, WOFO, and TA for both Korean and American college students were compared using independent sample t-tests. To compare mean scores of the CRT-RMS, the five excluded items from the Korean version were also dropped from the English version. Korean college students' mean scores of CRT-RMS, WOFO, and TA were 3.73, 65.92, and 56. 16, respectively, while US college students scored 2.69, 69.92, and 61. 48. T-tests showed that group level mean scores on the CRT-RMS between US and Korean college samples are significantly different (t (361) = -3.215, p < .05) and that Korean students scored higher than US college students. However, US college students' aggregated mean scores of self-report measures, WOFO and TA were higher than Korean students' self-report scores (WOFO t (356.345) = 4.442, p < .05, and TA t (337) = 5.934, p < .05, respectively).

Table 6 Mean score differences between Korean and US college students

	Group	N	Mean	Std. Deviation	Std. Error Mean
CRT-RMS Korean	US students	156	2.69	3.12	.25
	Korean students	188	3.73	2.84	.21
Work and Family Orientation Scale	US students	154	69.92	6.93	.56
	Korean students	186	65.92	7.97	.58
Test Anxiety Scale	US students	154	61.48	9.84	.79
	Korean students	186	56.16	7.80	.57

CHAPTER IV

DISCUSSION

The present study attempts to explore the external and discriminant validity of the CRT-RMS with Korean college students. While more studies are needed, it appears that the CRT-RMS may be a valid measure of achievement motivation within the Korean sample as it shows a significant association with objective college GPAs. Scores also varied meaningfully between Korean universities, with the higher mean associated with the more demanding school. The results provide two key implications. First, implicit motives to achieve and avoid failure seem to be meaningful across cultures. The CRT-RMS previously showed its utility with Romanian college students in predicting college GPAs above and beyond college entrance exams (Mot, 2003). In addition to European samples, the CRT-RMS now showed its validity with Asian samples. Implicit motives from the CRT-RMS are likely to be resistant to cultures. Second, for the first time an implicit personality measure is introduced to Korea. Since there was no implicit personality measure available in Korea before now, this study initiates a new implicit measure of achievement motivation in Korea.

The most important finding in this study is that although in Korea most of the research in the field of achievement motivation is conducted with self-report measures (e.g., Chang & Lee, 1994), none of the self-report measures of achievement motivation predicted objective college GPAs. On the other hand, the NEO-AM did predict self-reported GPAs while the CRT-RMS did not predict self-reported GPA. This study's results are along the

same lines as previous research, which suggests that explicit and implicit measures predict behavior differentially in a dissociative model. McClelland, Koestner, and Weinberger (1989) argued that the relationship between self-attributed cognition orientation and final grades are "just as likely that the cognitive orientations and self-attrubutions were a result of the grades received (i.e., those who did well ascribed achievement motivation to themselves)" (McClelland, Koestner, & Weingerger, 1989 pg. 61). The significant correlation between self-reported achievement motivation and GPAs seemed to be due to self-attribution of achievement motivation and GPAs. In addition, again McClelland et al. (1989) stated that self-attributed motives predict best when attitudes and behavior measures are closely matched. This is confirmed in this study that self-reported achievement motivation is only associated with self-reported GPA not objective GPA. Not only the US samples but also the Korean samples support the dissociative model.

Previous studies showed reference-group effect (RGE) when people compared group level mean scores from self-reported measures. Due to different reference group, comparison between countries based on aggregated mean scores lead to a serious minsinterpretation. To compensate for the problems mean scores of the CRT-RMS between US and Korean college students were compared. Interestingly, mean scores on the implicit personality measures showed that Korean college students scored significantly higher than US college samples; however, US college students scored significantly higher on explicit measures of

achievement and fear of failure motivation. There is an inconsistency on self-report measures of test anxiety (fear of failure) in that Koreans tend to show higher self-reported test anxiety than US high school students, while Korean college students show lower self-reported test anxiety than US college students. This inconsistency may be due to RGE or different response styles on a Likert scale across countries (i.e., extreme response style; see Clarke, 2000). Since self-report measures are not resistant to the biases of surrounding people, the aggregated mean scores have tenuous meaning when researchers compare groups. Clarke (2000) also mentioned that people from different countries tend to have different response types in that some cultures tend to select extreme responses while people with different cultures are likely to choose less extreme responses. Thus, more careful attention needs to be paid to make conclusions based on group level mean score differences.

Broader implication, limitations, and future directions

A number of previous studies question self-report measures for their accuracy (Greenwald & Farnham, 2000), precision when comparing conscientiousness across countries (Heine, Buchtel, & Norenzayan, 2008), and their usefulness in understanding cultural differences between countries (Chen, 2008). Thus, in addition to self-report measures of personality, a more valid and reliable measure of personality is needed. Furthermore, the internationally best-selling book "The World is Flat" by Friedman emphasized outsourcing as the world gets flatter. To hire people from outside of the US, a global selection measure is

essential. In this sense, the CRT-RMS, an implicit personality measure that shows promising validity with samples from outside of the US, will likely contribute to the selection process, as an addition to the self-report measures used when employers want to select employees who are highly motivated to achieve rather than those who fear failure.

This study explored noteworthy findings but could not avoid limitations. First, the significant validity is as low as .177. A priori power analysis showed 200 participants would be large enough to reach a power of .80 with a previous study effect size of .40. However, since the effect size of this study is low, the power is lower than was expected at .68. Gulliksen's (1958) formula for the *Effect of test length on validity* showed that if the number of items is tripled then the validity would be .20 and the power would reach to an acceptable level of .80. The low power may have led to an insignificant dependent correlation between the CRT-RMS and WOFO, and the CRT-RMS and NEO-AM. For future study, more items are needed to increase the effect size and the power. Second, in the Korean sample there were more female than male samples, while in US the male participants outnumbered the female participants. Thus, the mean score difference between the two countries could be due to gender differences. To remove this gender effect on the achievement motivation, balanced participants in terms of gender would be ideal.

Third, no cognitive ability measures were available to study the incremental predictive validity of the CRT-RMS in Korea. Therefore, it is unknown whether motivation

has a predictive validity over cognitive ability in the prediction of college GPAs in Korea. The US and European samples showed that the CRT-RMS has an incremental predictive validity above and beyond college admission exams (i.e. ACT) in predicting college GPA. As college admission systems are often changed in Korea, some students have been required to take admission tests while some have been accepted with only a sufficient high school GPA without taking any college entrance exams. In addition, the total possible points for college entrance exams varied depending on the year of high school graduation. Therefore, objective cognitive measures were not available for this sample.

Fourth, the reasons for the five invalid items on the Korean CRT-RMS are unknown. Neither the 97% endorsement of the fear of failure response nor 97% of participants selecting the achievement motivation alternative was expected. More than half of the respondents choosing illogical alternatives was also not predictable. It should be further investigated whether this is a result of problems with the translation process or due to differences in cultural biases. In any event, the Korean version of the CRT-RMS needs to be augmented with new items to evaluate its reliability and perhaps its validity.

Last but not least, a limitation could be that an analysis of measurement invariance was needed. This study could not conduct confirmatory factor analysis to compare factor structures. With a bigger sample size and more items, traditional ways of measurement comparion such as exploratory and confirmatory analyses are in need. In addition, more

fundamental measurement invariance is also recommended. This creates a new topic for future study.

For future studies, investigating the psychometric properties of the Korean and English versions of the CRT-RMS is recommended. For example, measurement invariance of implicit and explicit measures across cultures may provide meaningful information. This will show more fundamental and psychometrical evidence of whether both measures are invariant across cultures, just one of them is invariant or none of them are. Additionally, applying item response theory (IRT) to compare implicit and explicit measures cross-culturally will be interesting as IRT evaluates items from different perspectives, such as item difficulty level or discriminant power of each item. The cross-cultural study of implicit personality is a promising area that will increase our understanding of personality in general.

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